

# CHEMOSPHERE

---

**Contents and Author Index**  
**Volume 50, 2003**

---



PERGAMON

# CHEMOSPHERE

Editor-in-Chief Emeritus: O. Hutzinger

## Persistent Organic Pollutants and Dioxins

### Editors

**Michael S. Denison**

Dept. of Environmental Toxicology,  
Meyer Hall, One Shields Avenue,  
Davis, CA 95616-8588, U.S.A.  
Fax: + (1) 530 752 3394  
msdenison@ucdavis.edu

**Heidelore Fiedler**

UNEP Chemicals,  
Int. Environment House,  
11-13 Chemin des Anémones,  
CH-1219 Châtelaine (GE),  
Switzerland  
Fax: + (41) 22 797 3460  
hfiedler@unep.ch

### Editorial Board

**J. Albaiges** (Spain)  
**L. S. Birnbaum** (U.S.A.)  
**W. Farland** (U.S.A.)  
**R. Louw** (The Netherlands)  
**R. Malisch** (Germany)  
**Y. Masuda** (Japan)  
**L. L. Needham** (U.S.A.)  
**J. Rivera** (Spain)  
**S. Safe** (U.S.A.)

## Environmental Chemistry

### Editors

**Michael Oehme**

Organic Analytical Chemistry,  
University of Basel,  
IWB/GSA, Neuhausstraße 31,  
CH-4067 Basel, Switzerland  
Fax: + (41) 61 639 23 00  
Michael.Oehme@unibas.ch

**Kurunthachalam Kannan**

National Food Safety and  
Toxicology Center,  
Michigan State University,  
East Lansing, MI 48824,  
U.S.A.  
Fax: + (1) 517 432 2310  
kuruntha@msu.edu

### Associate Editors

**D. MacKay**

Trent University,  
Canada  
dmackay@trentu.ca

**A. Sabljic**

Institute Rudjer Boskovic,  
Croatia  
Sabljic@rudjer.irb.hr

### Editorial Board

**P. Boule** (France)  
**D. W. Connell** (Australia)  
**B. Jansson** (Sweden)  
**M. McLachlan** (Germany)  
**M. Spiteller** (Germany)  
**M. Suter** (Switzerland)  
**L. J. Thibodeaux** (France)  
**P. R. Wallnöfer** (Germany)

## Environmental Toxicology and Risk Assessment

### Editors

**John P. Giesy**

Department of Zoology,  
Michigan State University,  
East Lansing, MI 48824-1115,  
U.S.A.  
Fax: + (1) 517 655 1532  
Jgiesy@aol.com

**Martin van den Berg**

Research Institute of  
Toxicology,  
University of Utrecht,  
P. O. Box 80.176,  
Utrecht 3508 TD,  
The Netherlands  
Fax: + (31) 30 253 5077  
m.vandenbergh@ntox.vet.uu.nl

### Associate Editor

**M. Yasuno**

University of Shiga,  
Japan  
Eco99@biwa.eqc.kyoto-u.ac.jp

### Editorial Board

**G. T. Ankley** (U.S.A.)  
**S. M. Bartell** (U.S.A.)  
**D. Calamari** (Italy)  
**J. Kukkonen** (Finland)  
**P. F. Landrum** (U.S.A.)  
**D. Tillitt** (U.S.A.)  
**Ch. Schlatter** (Switzerland)  
**D. Schrenk** (Germany)

## Science For Environmental Technology

### Editor

**Oliver J. Hao**

Department of Civil and  
Environmental Engineering,  
University of Maryland,  
College Park, MD 20742,  
U.S.A.  
Fax: + (1) 301 405 2585  
ojh1@eng.umd.edu

### Editorial Board

**E. C. Butler** (U.S.A.)  
**A. Davis** (U.S.A.)  
**J. J. Kilbane II** (U.S.A.)  
**C. F. Lin** (Taiwan)  
**J. M. Novak** (U.S.A.)  
**D. Lenoir** (Germany)  
**K. Jayachandran** (U.S.A.)  
**J. R. Mihelcic** (U.S.A.)  
**W. F. Schmidt** (U.S.A.)

## Global Change Science

### Editor

**M. A. K. Khalil**

Department of Physics,  
Portland State University,  
P.O. Box 751,  
Portland, OR 97207-0751,  
U.S.A.  
Fax: + (1) 503 725 8550  
asklam@global.phy.pdx.edu

### Associate Editor

**M. Shearer**

Portland State University,  
U.S.A.  
marty@global.phy.pdx.edu

### Editorial Board

**V. P. Aneja** (U.S.A.)  
**P. Brimblecombe** (U.K.)  
**R. Conrad** (Germany)  
**C. I. Davidson** (U.S.A.)  
**D. Erickson** (U.S.A.)  
**R. Harriss** (U.S.A.)  
**L. Husain** (U.S.A.)  
**D. Kammen** (U.S.A.)  
**V. W. J. H. Kirchhoff** (Brazil)  
**H. Papan** (Germany)  
**D. C. Parashar** (India)  
**S. A. Penkett** (U.K.)  
**J. Pinto** (U.S.A.)  
**R. A. Rasmussen** (U.S.A.)  
**W. Seiler** (Germany)

# Contents of Volume

Volume 50 No. 1

## SCIENCE FOR ENVIRONMENTAL TECHNOLOGY

- 1 Chemically reduced excess sludge production in the activated sludge process  
Y. LIU (Singapore)
- 9 Decomposition of halogenated methanes in oxygen-free gas mixtures by the use of a silent electric discharge  
K. A. FÖGLEIN, J. SZÉPVÖLGYI & A. DOMBI (Hungary)
- 15 Inclusion of vegetable oils in Fenton's chemistry for remediation of PAH-contaminated soils  
B. W. BOGAN, V. TRBOVIC & J. R. PATEREK (USA)
- 23 Removal of Cu and Pb by tartaric acid modified rice husk from aqueous solutions  
K. K. WONG, C. K. LEE, K. S. LOW & M. J. HARON (Malaysia)
- 29 Application of the headspace CO<sub>2</sub> method (ISO 14 593) to the assessment of the ultimate biodegradability of surfactants: results of a calibration exercise  
H. A. PAINTER, P. REYNOLDS & S. COMBER (UK)
- 39 The enhancement of TiO<sub>2</sub> photocatalytic activity by hydrogen thermal treatment  
H. LIU, H.T. MA, X.Z. LI, W.Z. LI, M. WU & X. H. BAO (China)
- 47 Combined glassification of EAF dust and incinerator fly ash  
T. W. CHENG (Taiwan)
- 53 Sediment characteristics, phosphorus types and phosphorus release rates between river and lake sediments  
L.-H. KIM (USA), E. CHOI (South Korea) & M. K. STENSTROM (USA)
- 63 Biodegradability of biofilm extracellular polymeric substances  
X. ZHANG & P. L. BISHOP (USA)
- 71 Photo-Fenton treatment of water containing natural phenolic pollutants  
W. GERNJAK, T. KRUTZLER, A. GLASER (Austria), S. MALATO, J. CACERES (Spain), R. BAUER (Austria) & A. R. FERNÁNDEZ-ALBA (Spain)
- 79 Removal of indoor pollutants under UV irradiation by a composite TiO<sub>2</sub>-zeolite sheet prepared using a papermaking technique  
H. ICHIURA, T. KITAOKA & H. TANAKA (Japan)
- 85 Treatment of pharmaceutical wastewater containing antibiotics by O<sub>3</sub> and O<sub>3</sub>/H<sub>2</sub>O<sub>2</sub> processes  
I. AKMEHMET BALCIOĞLU & M. ÖTKER (Turkey)
- 97 Electrochemical degradation of *p*-substituted phenols of industrial interest on Pt electrodes. Attempt of a structure-reactivity relationship assessment  
R. A. TORRES (Switzerland, Colombia), W. TORRES (Colombia), P. PERINGER & C. PULGARIN (Switzerland)
- 105 Coupled oxidation of aromatic hydrocarbons by horseradish peroxidase and hydrogen peroxide  
J. FANG & M. J. BARCELONA (USA)
- 111 Photocatalytic reactions of pyrene at TiO<sub>2</sub>/water interfaces  
S. WEN, J. ZHAO, G. SHENG, J. FU & P. PENG (China)
- 121 Treatment of domestic wastewater by an hydroponic NFT system  
N. VAILLANT, F. MONNET, H. SALLANON, A. COUDRET & A. HITMI (France)
- 131 Performance of three-phase three-dimensional electrode reactor for the reduction of COD in simulated wastewater-containing phenol  
Y. XIONG (China, Sweden), C. HE (China), H. T. KARLSSON (Sweden) & X. ZHU (China)
- 137 Tolerance and uptake of heavy metals by *Trichoderma atroviride* isolated from sludge  
E. LÓPEZ ERRASQUÍN & C. VÁZQUEZ (Spain)
- 145 Biological treatment process of air loaded with an ammonia and hydrogen sulfide mixture  
L. MALHAUTIER, C. GRACIAN, J.-C. ROUX, J.-L. FANLO & P. LE CLOIREC (France)
- 155 Sorption of As(V) ions by akaganéite-type nanocrystals  
E. A. DELIYANNI, D. N. BAKOYANNAKIS, A. I. ZOUBOULIS & K. A. MATIS (Greece)

- 165 The inhibitory effects of lindane in batch and upflow anaerobic sludge blanket reactors  
T. H. ERGÜDER (Turkey), E. GÜVEN (USA) & G. N. DEMIRER (Turkey)
- 171 BOD<sub>5</sub> measurements of water presenting inhibitory Cu<sup>2+</sup>. Implications in using of BOD to evaluate biodegradability of industrial wastewaters  
A. HUFSCHEID, K. BECKER-VAN SLOOTEN, A. STRAWCZYNSKI, P. VIOGET, S. PARRA, P. PÉRINGER & C. PULGARIN (Switzerland)

## Volume 50 No. 2

### GLOBAL CHANGE SCIENCE

- 177 Impact of ozone mini-holes on the heterogeneous destruction of stratospheric ozone  
A. STENKE & V. GREWE (Germany)
- 191 Theoretical consideration of methane emission from sediments  
N. M. BAZHIN (Russian Federation)
- 201 Models to predict emissions of health-damaging pollutants and global warming contributions of residential fuel/stove combinations in China  
R. D. EDWARDS, K. R. SMITH, J. ZHANG (USA) & Y. MA (China)
- 217 The effect of long-term atmospheric CO<sub>2</sub> enrichment on the intrinsic water-use efficiency of sour orange trees  
S. W. LEAVITT, S. B. IDSO, B. A. KIMBALL, J. M. BURNS, A. SINHA & L. STOTT (USA)
- 223 Global eddy permitting simulations of surface ocean nitrogen, iron, sulfur cycling  
S. CHU, S. ELLIOTT & M. E. MALTRUD (USA)
- 237 Methane emission from fields with differences in nitrogen fertilizers and rice varieties in Taiwan paddy soils  
R.-M. LIOU, S.-N. HUANG & C.-W. LIN (Taiwan, ROC)
- 247 Contribution of winter to the annual CH<sub>4</sub> emission from a eutrophied boreal lake  
J. T. HUTTUNEN, J. ALM, E. SAARIJÄRVI, K. M. LAPPALAINEN, J. SILVOLA & P. J. MARTIKAINEN (Finland)

## Volume 50 No. 3

### ENVIRONMENTAL TOXICOLOGY AND RISK ASSESSMENT

- 251 Fluoride toxicity to aquatic organisms: a review  
J. A. CAMARGO (Spain)
- 265 Concentrations and hazard assessment of PCBs, organochlorine pesticides and mercury in fish species from the upper Thames: River pollution and its potential effects on top predators  
N. YAMAGUCHI, D. GAZZARD, G. SCHOLEY & D. W. MACDONALD (UK)
- 275 Contribution of metabolites to mutagenicity during anaerobic biodegradation of fenitrothion  
T. MATSUSHITA, Y. MATSUI, K. IKEBA & T. INOUE (Japan)
- 283 Model description of an alternately operated wastewater treatment plant—evaluation of the applicability of SimpleTreat  
P. FAUSER, P. B. SØRENSEN, L. CARLSEN & J. VIKELSØE (Denmark)
- 293 Pyrene-induced changes of glutathione-S-transferase activities in different microalgal species  
A.-P. LEI, Y.-S. WONG & N. FUNG-YEE TAM (Hong Kong)
- 303 Trichloroacetic acid in Norway spruce/soil-system I. Biodegradation in soil  
M. MATUCHA, S. T. FORCZEK, M. GRYNDLER, H. UHLÍŘOVÁ, K. FUKSOVÁ (Czech Republic) & P. SCHRÖDER (Germany)
- 311 Butyltins concentration levels and imposex occurrence in snails from the Sicilian coasts (Italy)  
S. CHIAVARINI, P. MASSANISSO, P. NICOLAI, C. NOBILI & R. MORABITO (Italy)

- 321 Comparison of biodegradation of surfactants in soils and sludge-soil mixtures by use of  $^{14}\text{C}$ -labelled compounds and automated respirometry  
B. GEJLSBJERG, T. MADSEN & T. T. ANDERSEN (Denmark)
- 333 The use of mosses as environmental metal pollution indicators  
M. ACETO, O. ABOLLINO, R. CONCA, M. MALANDRINO, E. MENTASTI & C. SARZANINI (Italy)
- 343 Aquatic ecological risks due to cyanide releases from biomass burning  
T. R. BARBER, C. C. LUTES, M. R. J. DOORN, P. C. FUCHSMAN (USA), H. J. TIMMENG (Canada) & R. L. CROUCH (USA)
- 349 Influence of organic solvents on the sensitivity of a bioluminescence toxicity test with *Vibrio harveyi*  
A. MARISCAL, M. T. PEINADO, M. CARNERO-VARO & J. FERNÁNDEZ-CREHUET (Spain)
- 355 Silica reduces the toxicity of aluminium to a tropical freshwater fish (*Mogurnda mogurnda*)  
C. CAMILLERI, S. J. MARKICH, B. N. NOLLER, C. J. TURLEY, G. PARKER & R. A. VAN DAM (Australia)
- 365 Cyst-based toxicity tests. XI. Influence of the type of food on the intrinsic growth rate of the rotifer *Brachionus calyciflorus* in short-chronic toxicity tests  
C. BELGIS (Panama) & P. GUIDO (Belgium)
- 373 Effects of ethylene glycol ethers on the reproduction of *Ceriodaphnia dubia*  
J. DEVILLERS, A. CHEZEAU, V. POULSEN & E. THYBAUD (France)
- 377 Polycyclic aromatic hydrocarbons air levels in Florence, Italy, and their correlation with other air pollutants  
M. LODOVICI, M. VENTURINI, E. MARINI, D. GRECHI & P. DOLARA (Italy)
- 383 Comparison of mercury and methylmercury in northern pike and Arctic grayling from western Alaska rivers  
S. C. JEWETT, X. ZHANG, A. S. NAIDU, J. J. KELLEY, D. DASHER & L. K. DUFFY (USA)
- 393 Evaluation of the phytotoxicity of contaminated sediments deposited "on soil". I. Impact of water draining from the deposit on the germination of neighbouring plants  
J.-P. BEDELL, A. BRIANT, C. DELOLME & Y. PERRODIN (France)
- 403 Acute toxicity and quantitative structure-activity relationships of  $\alpha$ -branched phenylsulfonyl acetates to *Daphnia magna*  
X. LIU, B. WANG, Z. HUANG, S. HAN & L. WANG (PR China)
- 409 Toxicity and bioavailability to bacteria of particle-associated arsenite and mercury  
T. PETÄNEN & M. ROMANTSCHUK (Finland)
- 415 Soil microbial parameters and luminescent bacteria assays as indicators for in situ bioremediation of TNT-contaminated soils  
T. FRISCHE & H. HÖPER (Germany)
- 429 Suppression of sexual behavior in male Japanese medaka (*Oryzias latipes*) exposed to  $17\beta$ -estradiol  
Y. OSHIMA, I. J. KANG, M. KOBAYASHI, K. NAKAYAMA, N. IMADA & T. HONJO (Japan)
- 437 Effects of the antibacterial agents tiamulin, olanquinox and metronidazole and the anthelmintic ivermectin on the soil invertebrate species *Folsomia fimetaria* (Collembola) and *Enchytraeus crypticus* (Enchytraeidae)  
J. JENSEN, P. H. KROGH (Denmark) & L. E. SVERDRUP (Norway)
- 445 Effect of Diuron on aquatic bacteria in laboratory-scale wastewater treatment ponds with special reference to *Aeromonas* species studied by colony hybridization  
SUMPONO (France, Indonesia), P. PEROTTI, A. BELAN, C. FORESTIER, B. LAVEDRINE & J. BOHATIER (France)

#### Volume 50 No. 4

#### PERSISTENT ORGANIC POLLUTANTS AND DIOXINS

- 457 Elementary reaction path on polychlorinated biphenyls formation from polychlorinated benzenes in heterogeneous phase using ab initio molecular orbital calculation  
M. HIROTA, H. TAKASHITA, J. KATO & A. FUWA (Japan)
- 469 PCB and PAH releases from power stations and waste incineration processes in the UK  
P. H. DYKE, C. FOAN (UK) & H. FIEDLER (Switzerland)

- 481 Congener-specific accumulation of polychlorinated biphenyls in ovarian follicular wall follows repeated exposure to PCB 126 and PCB 153. Comparison of tissue levels of PCB and biological changes  
E. L. GREGORASZCZUK, A. GROCHOWALSKI, R. CHRZASZCZ & M. WEGIEL (Poland)
- 489 Catalytic NO<sub>x</sub> reduction with simultaneous dioxin and furan oxidation  
M. GOEMANS, P. CLARYSSE, J. JOANNÈS, P. DE CLERCQ, S. LENAERTS, K. MATTHYS & K. BOELS (Belgium)
- 499 Correlation relationships between physico-chemical properties and gas chromatographic retention index of polychlorinated-dibenzofurans  
Y. H. WANG (China, Hong Kong) & P. K. WONG (Hong Kong)
- 507 Organochlorine pesticides in the surface waters of Northern Greece  
S. K. GOLFINOPOULOS, A. D. NIKOLAOU, M. N. KOSTOPOULOU, N. K. XILOURGIDIS, M. C. VAGI & D. T. LEKKAS (Greece)
- 517 Adsorption kinetics of methyl violet onto perlite  
M. DOĞAN & M. ALKAN (Turkey)
- 529 A method to determine residue levels of persistent organochlorine pesticides in human milk from Indonesian women  
E. R. BURKE, A. J. HOLDEN (UK) & I. C. SHAW (New Zealand)
- 537 Metabolic pathways of polychlorinated biphenyls degradation by *Pseudomonas* sp. 2  
M. KOMANCOVÁ, I. JURCOVÁ, L. KOCHÁNKOVÁ & J. BURKHARD (Czech Republic)
- 545 VOC concentration characteristics in Southern Taiwan  
C.-C. HSIEH & J.-H. TSAI (Taiwan)
- 557 Persistent organic pollutants in water and surface sediments of Taihu Lake, China and risk assessment  
H. WANG, C. WANG, W. WU, Z. MO & Z. WANG (PR China)
- 563 Horizontal and vertical distribution of organic contaminants in deep-sea fish species  
S. MORMEDE & I. M. DAVIES (UK)

#### Volume 50 No. 5

#### ENVIRONMENTAL CHEMISTRY

- 575 Determination and comparison of nitrated-polycyclic aromatic hydrocarbons measured in air and diesel particulate reference materials  
H. A. BAMFORD, D. Z. BEZABEH, M. M. SCHANTZ, S. A. WISE & J. E. BAKER (USA)
- 589 Behaviour of forchlorfenuron residues in grape, soil and water  
D. SHARMA & M. D. AWASTHI (India)
- 595 Investigations of the determination and transformations of diazinon and malathion under environmental conditions using gas chromatography coupled with a flame ionisation detector  
M. BAVCON, P. TREBŠE & L. ZUPANČIČ-KRALJ (Slovenia)
- 603 NMR and molecular modeling in environmental chemistry: prediction of <sup>13</sup>C chemical shifts in selected C<sub>10</sub>-chloroterpenes employing DFT/GIAO theory  
K. TUPPURAINEN & J. RUUSKANEN (Finland)
- 611 Sources and patterns of polycyclic aromatic hydrocarbons pollution in kitchen air, China  
L. ZHU & J. WANG (China)
- 619 Decolorization and degradation of H-acid and other dyes using ferrous-hydrogen peroxide system  
K. SWAMINATHAN, S. SANDHYA, A. CARMALIN SOPHIA, K. PACHHADE & Y. V. SUBRAHMANYAM (India)
- 627 Multivariate characterization of polycyclic aromatic hydrocarbons using semi-empirical molecule orbital calculations and physical data  
A. KITTI, M. HARJU, M. TYSKLIND & B. VAN BAVEL (Sweden)
- 639 Fluorescence spectroscopic studies of natural organic matter fractions  
J. CHEN, E. J. LEBOEUF, S. DAI & B. GU (USA)



- 649 Photochemical behaviour of carbendazim in aqueous solution  
A. BOUDINA (France, Algeria), C. EMMELIN (France), A. BAALIOUAMER (Algeria), M. F. GRENIER-LOUSTALOT & J. M. CHOVELON (France)
- 657 Identification of some plasticizers compounds in landfill leachate  
I. NASCIMENTO FILHO, C. VON MÜHLEN, P. SCHÖSSLER & E. B. CARAMÃO (Brazil)
- 665 Biodegradation pathways of hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) by *Clostridium acetobutylicum* cell-free extract  
C. ZHANG & J. B. HUGHES (USA)
- 673 Generation rates and emission factors of particulate matter and particle-bound polycyclic aromatic hydrocarbons of incense sticks  
S.-C. C. LUNG & S.-C. HU (Taiwan, ROC)

**Volume 50 No. 6****SPECIAL ISSUE: SOIL AND ENVIRONMENTAL QUALITY IN MODERN CHINA**

681 Preface

**Soil-Water Interaction and its Impact on Water Quality**

- 683 Organo-chlorine pesticide (DDT and HCH) residues in the Taihu Lake Region and its movement in soil-water system I. Field survey of DDT and HCH residues in ecosystem of the region  
K. FENG, B. Y. YU, D. M. GE (China), M. H. WONG (Hong Kong), X. C. WANG & Z. H. CAO (China)
- 689 Preliminary study of phosphorus runoff and drainage from a paddy field in the Taihu Basin  
Q. ZUO, C. A. LU & W. L. ZHANG (China)
- 695 Effect of phosphate fertilizer application on phosphorus (P) losses from paddy soils in Taihu Lake Region I. Effect of phosphate fertilizer rate on P losses from paddy soil  
H. C. ZHANG, Z. H. CAO, Q. R. SHEN (China) & M. H. WONG (PR China)
- 703 Characteristics of nitrate horizontal transport in a paddy field of the Tai Lake region, China  
X. M. CHEN, Q. R. SHEN, G. X. PAN & Z. P. LIU (China)
- 707 Status of trace elements in paddy soil and sediment in Taihu Lake region  
X. C. WANG, W. D. YAN, Z. AN, Q. LU, W. M. SHI, Z. H. CAO (China) & M. H. WONG (Hong Kong)
- 711 Novel use of soil moisture samplers for studies on anaerobic ammonium fluxes across lake sediment-water interfaces  
J. SONG, Y. M. LUO, Q. G. ZHAO (China) & P. CHRISTIE (UK)
- 717 The transportation, time-dependent distribution of heavy metals in paddy crops  
C. X. WANG, Z. MO, H. WANG, Z. J. WANG (PR China) & Z. H. CAO (China)

**Soil Chemistry Related to Environmental Quality**

- 725 Nitrate distribution and denitrification in the saturated zone of paddy field under rice/wheat rotation  
J. G. ZHU, G. LIU, Y. HAN, Y. L. ZHANG & G. X. XING (China)
- 733 Difference of lead, copper and zinc concentrations between interiors and exteriors of peds in some contaminated soils  
M. K. ZHANG & J. M. XU (China)
- 739 Content and distribution of forms of organic N in soil and particle size fractions after long-term fertilization  
Y. C. XU, Q. R. SHEN & W. RAN (China)
- 747 Mechanisms of nitrite accumulation occurring in soil nitrification  
Q. R. SHEN, W. RAN & Z. H. CAO (China)
- 755 Chemical behavior of Cd in rice rhizosphere  
Q. LIN, Y. X. CHEN, H. M. CHEN, Y. L. YU, Y. M. LUO (China) & M. H. WONG (PR China)
- 763 Study on fluoride emission from soils at high temperature related to brick-making process  
Z. M. XIE, W. H. WU & J. M. XU (PR China)

- 771 Rapid degradation of butachlor in wheat rhizosphere soil  
Y. L. YU, Y. X. CHEN, Y. M. LUO, X. D. PAN, Y. F. HE & M. H. WONG (PR China)

#### Plants Response to Contaminants

- 775 Ecological restoration of mine degraded soils, with emphasis on metal contaminated soils  
M. H. WONG (Hong Kong)
- 781 Effect of cadmium on nodulation and  $N_2$ -fixation of soybean in contaminated soils  
Y. X. CHEN, Y. F. HE, Y. YANG, Y. L. YU, S. J. ZHENG, G. M. TIAN, Y. M. LUO (China) & M. H. WONG (PR China)
- 789 Physiological mechanism of plant roots exposed to cadmium  
Y. X. CHEN, Y. F. HE, Y. M. LUO, Y. L. YU, Q. LIN (China) & M. H. WONG (PR China)
- 795 Copper tolerance, uptake and accumulation by *Phragmites australis*  
Z. H. YE (PR China), A. J. M. BAKER (Australia), M. H. WONG (PR China) & A. J. WILLIS (UK)
- 801 Effect of DBP/DEHP in vegetable planted soil on the quality of capsicum fruit  
R. YIN, X. G. LIN, S. G. WANG & H. Y. ZHANG (China)

#### Remediation of Contaminated Soil Using Chelators and Soil Amendments

- 807 The role of citric acid on the phytoremediation of heavy metal contaminated soil  
Y. X. CHEN, Q. LIN, Y. M. LUO, Y. F. HE, S. J. ZHEN, Y. L. YU, G. M. TIAN (China) & M. H. WONG (Hong Kong)
- 813 Soil Cd availability to Indian mustard and environmental risk following EDTA addition to Cd-contaminated soil  
X. J. JIANG, Y. M. LUO, Q. G. ZHAO (China), A. J. M. BAKER (Australia), P. CHRISTIE (UK) & M. H. WONG (Hong Kong, PR China)
- 819 Effects of EDTA and low molecular weight organic acids on soil solution properties of a heavy metal polluted soil  
L. H. WU, Y. M. LUO (China), P. CHRISTIE (UK) & M. H. WONG (Hong Kong)
- 823 Chemical speciation and extractability of Zn, Cu and Cd in two contrasting biosolids-amended clay soils  
X. L. QIAO, Y. M. LUO (China), P. CHRISTIE (UK) & M. H. WONG (Hong Kong)

#### Remidiation of Soil Using Microorganisms

- 831 Influence of early stages of arbuscular mycorrhiza on uptake of zinc and phosphorus by red clover from a low-phosphorus soil amended with zinc and phosphorus  
Y. L. BI, X. L. LI (People's Republic of China) & P. CHRISTIE (People's Republic of China, UK)
- 839 The role of arbuscular mycorrhiza in zinc uptake by red clover growing in a calcareous soil spiked with various quantities of zinc  
B. D. CHEN, X. L. LI, H. Q. TAO (China), P. CHRISTIE (China, UK) & M. H. WONG (Hong Kong)
- 847 Interactions between arbuscular mycorrhizae and heavy metals under sand culture experiment  
J. P. LIAO, X. G. LIN, Z. H. CAO, Y. Q. SHI (China) & M. H. WONG (Hong Kong)
- 855 Changes in soil microbial biomass and Zn extractability over time following Zn addition to a paddy soil  
X. J. JIANG, Y. M. LUO, S. L. LIU, K. Q. DING, S. C. WU, Q. G. ZHAO (China) & P. CHRISTIE (UK)
- 863 Growth and nutrient uptake of arbuscular mycorrhizal maize in different depths of soil overlying coal fly ash  
Y. L. BI, X. L. LI (China), P. CHRISTIE (China, UK), Z. Q. HU (China) & M. H. WONG (Hong Kong)

#### Volume 50 No. 7

#### ENVIRONMENTAL CHEMISTRY

- 871 Environmental properties and effects of nonionic surfactant adjuvants in pesticides: a review  
K. A. KROGH, B. HALLING-SØRENSEN, B. B. MOGENSEN & K. V. VEJRUP (Denmark)



- 903 Measurement of  $^{13}\text{C}/^{12}\text{C}$  of chloroacetic acids by gas chromatography/combustion/isotope ratio mass spectrometry  
C. S. WONG, D. C. G. MUIR & S. A. MABURY (Canada)
- 911 Copper and zinc retention by an organically amended soil  
E. DÍAZ-BARRIENTOS, L. MADRID, C. MAQUEDA, E. MORILLO, E. RUIZ-CORTÉS, E. BASALLOTE & M. CARRILLO (Spain)
- 919 Chemical and microbial hypotheses explaining the effect of wastewater treatment plant discharges on the nitrifying communities in freshwater sediment  
C. FÉRAY & B. MONTUELLE (France)
- 929 Biodegradation of linear alkylbenzene sulfonates in sulfate-leached soil mesocosms  
L. ELSGAARD (Denmark), G. POJANA, T. MIRAVAL (Italy), J. ERIKSEN (Denmark) & A. MARCOMINI (Italy)
- 939 Multiple regression modelling of mineral base oil biodegradability based on their physical properties and overall chemical composition  
F. HAUS, O. BOISSEL & G.-A. JUNTER (France)
- 949 QSAR modeling with the electrotopological state indices: predicting the toxicity of organic chemicals  
J. HUUSKONEN (Finland)
- 955 Remediation of waters contaminated with pentachlorophenol  
R. A. ABRAMOVITCH & M. CAPRACOTTA (USA)

**Volume 50 No. 8****SCIENCE FOR ENVIRONMENTAL TECHNOLOGY**

- 959 Reduction of the phenolic components in olive-mill wastewater by an enzymatic treatment and its impact on durum wheat (*Triticum durum* Desf.) germinability  
R. CASA, A. D'ANNIBALE, F. PIERUCCETTI, S. R. STAZI, G. G. SERMANNI & B. LO CASCIO (Italy)
- 967 Phytoremediation of selenium by two helophyte species in subsurface flow constructed wetland  
SHARDENDU (India, Germany), N. SALHANI (Germany), S. F. BOULYGA (Belarus, Germany) & E. STENGEL (Germany)
- 975 Decolorization of structurally different synthetic dyes using cobalt(II)/ascorbic acid/hydrogen peroxide system  
P. VERMA, P. BALDRIAN & F. NERUD (Czech Republic)
- 981 The direct photolysis and photocatalytic degradation of alachlor at different  $\text{TiO}_2$  and UV sources  
C. C. WONG & W. CHU (Hong Kong)
- 989 Photoelectrocatalytic degradation of 4-chlorophenol and oxalic acid on titanium dioxide electrodes  
G. WALDNER, M. POURMODJIB, R. BAUER & M. NEUMANN-SPALLART (Austria)
- 999 The light transmission and distribution in an optical fiber coated with  $\text{TiO}_2$  particles  
W. WANG & Y. KU (Taiwan, ROC)
- 1007 Radiolysis of aqueous phenol solutions with nanoparticles. 1. Phenol degradation and TOC removal in solutions containing  $\text{TiO}_2$  induced by UV,  $\gamma$ -ray and electron beams  
N. CHITOSE, S. UETA, S. SEINO & T. A. YAMAMOTO (Japan)
- 1015 Sonolysis of alkylphenols in aqueous solution with Fe(II) and Fe(III)  
B. YIM (Japan), Y. YOO (South Korea) & Y. MAEDA (Japan)
- 1025 Ozone treatment of soil contaminated with aniline and trifluralin  
A. C. PIERPOINT, C. J. HAPEMAN & A. TORRENTS (USA)
- 1035 Catalytic reduction of NO on copper/MCM-41 studied by in situ EXAFS and XANES  
Y.-J. HUANG, H. P. WANG & J.-F. LEE (Taiwan)
- 1043 Improvement of DOC removal by multi-stage AOP-biological treatment  
FAHMI, W. NISHIJIMA & M. OKADA (Japan)
- 1049 Application of Fenton's reagent to regenerate activated carbon saturated with organochloro compounds  
L. C. TOLEDO, A. C. B. SILVA, R. AUGUSTI & R. M. LAGO (Brazil)

- 1055 Biotransformation of cyanide to methane and ammonia by *Klebsiella oxytoca*  
C. M. KAO, J. K. LIU, H. R. LOU, C. S. LIN & S. C. CHEN (Taiwan, ROC)
- 1063 Effect of reducing conditions on sludge melting process  
Y.-C. HUANG & K.-C. LI (Taiwan, ROC)
- 1069 Biodegradation of 2,4-dichlorophenol in sequencing batch reactors augmented with immobilized mixed culture  
X. QUAN, H. SHI, J. WANG & Y. QIAN (PR China)
- 1075 A comparative study on the biosorption characteristics of some yeasts for Remazol Blue reactive dye  
Z. AKSU & G. DÖNMEZ (Turkey)
- 1085 Solar activated ozonation of phenol and malic acid  
L. SÁNCHEZ, X. DOMÈNECH, J. CASADO & J. PERAL (Spain)
- 1095 Adsorption behavior of reactive dye in aqueous solution on chemical cross-linked chitosan beads  
M. S. CHIOU & H. Y. LI (Taiwan, ROC)
- 1107 Sonochemically induced decomposition of energetic materials in aqueous media  
L. R. QADIR, E. J. OSBURN-ATKINSON, K. E. SWIDER-LYONS, V. M. CEPÁK & D. R. ROLISON (USA)
- 1115 Characterization and reactivity of natural manganese ore catalysts in the selective catalytic oxidation of ammonia to nitrogen  
J. Y. LEE, S. B. KIM & S. C. HONG (South Korea)

#### Volume 50 No. 9

#### PERSISTENT ORGANIC POLLUTANTS AND DIOXINS

- 1123 Emissions of polychlorinated dibenzo-*p*-dioxins and dibenzofurans from stack flue gases of sinter plants  
L.-C. WANG, W.-J. LEE, P.-J. TSAI, W.-S. LEE & G.-P. CHANG-CHIEN (Taiwan, ROC)
- 1131 PCBs, PCNs, PCDD/Fs, PAHs and Cl-PAHs in air and water particulate samples—patterns and variations  
R. ISHAQ, C. NÄF, Y. ZEBÜHR, D. BROMAN & U. JÄRNBERG (Sweden)
- 1151 Isomer specific synthesis using the Suzuki-coupling. Polychlorinated terphenyls as standards for environmental analysis  
M. BAHADIR, A. PIEPER, R. VOGT, H. WICHMANN, J. GRUNENBERG & H. HOPF (Germany)
- 1157 Optimization of the purification method for dioxin analysis in human serum and temporal changes in background dioxin levels in the general population  
O. AOZASA, A. MOCHIZUKI, S. OHTA, T. NAKAO, H. MIYATA & T. NOMURA (Japan)
- 1167 Estrogenic effects of phenolic compounds on glucose-6-phosphate dehydrogenase in MCF-7 cells and uterine glutathione peroxidase in rats  
K. B. KIM, K. W. SEO, Y. J. KIM, M. PARK, C. W. PARK, P. Y. KIM, J. I. KIM & S. H. LEE (South Korea)
- 1175 Improvements in dioxin abatement strategies at a municipal waste management plant in Barcelona  
E. ABAD, J. CAIXACH & J. RIVERA (Spain)
- 1183 Quantification of PCDD/F concentrations in animal manure and comparison of the effects of the application of cattle manure and sewage sludge to agricultural land on human exposure to PCDD/Fs  
J. L. STEVENS & K. C. JONES (UK)
- 1193 Human exposure to dioxins through the diet in Catalonia, Spain: carcinogenic and non-carcinogenic risk  
J. M. LLOBET, J. L. DOMINGO, A. BOCIO, C. CASAS, A. TEIXIDÓ (Spain) & L. MÜLLER (Germany)
- 1201 PCDD/Fs and PCBs in Baltic herring during the 1990s  
H. KIVIRANTA, T. VARTIAINEN, R. PARMANNE, A. HALLIKAINEN & J. KOISTINEN (Finland)
- 1217 Photodegradation of PCDD/Fs adsorbed on spruce (*Picea abies* (L.) Karst.) needles under sunlight irradiation  
J. NIU, J. CHEN (PR China, Germany), B. HENKELMANN (Germany), X. QUAN, F. YANG (PR China), A. KETRUP & K.-W. SCHRÄMM (Germany)
- 1227 Fate of 1,2,3,4,6,7,8-heptachlorodibenzofuran and pentachlorophenol during laboratory-scale anaerobic mesophilic sewage sludge digestion  
J. L. STEVENS, N. J. L. GREEN & K. C. JONES (UK)

- 1235 Formation behavior of PCDD/Fs in PVC pyrolysis with copper oxide  
E. SHIBATA, S. YAMAMOTO, E. KASAI & T. NAKAMURA (Japan)
- 1243 Fate of isoxaben in a containerized plant rhizosphere system  
C. E. DRAKEFORD, N. D. CAMPER & M. B. RILEY (USA)
- 1249 Irreversible binding of *o,p'*-DDD in interrenal cells of Atlantic cod (*Gadus morhua*)  
Ö. LINDHE, I. BRANDT (Sweden), J. S. CHRISTIANSEN & K. INGEBRIGTSEN (Norway)
- 1255 Hydrodehalogenation of chlorobenzene on activated carbon and activated carbon supported catalysts  
D. SANTORO, V. DE JONG & R. LOUW (The Netherlands)
- 1261 Increased PCDD/F formation in the bottom ash from fires of CCA-treated wood  
N. W. TAME, B. Z. DLUGOGORSKI & E. M. KENNEDY (Australia)

**Volume 50 No. 10****ENVIRONMENTAL CHEMISTRY**

- 1265 A statistical comparison of naphthenic acids characterized by gas chromatography-mass spectrometry  
J. S. CLEMENTE, N. G. N. PRASAD, M. D. MACKINNON & P. M. FEDORAK (Canada)
- 1275 Linear free energy relationships for dechlorination of aromatic chlorides by Pd/Fe  
Y. LIU, F. YANG, J. CHEN, L. GAO & G. CHEN (PR China)
- 1281 Distribution of polycyclic aromatic hydrocarbons in agricultural soils in South Korea  
J. J. NAM, B. H. SONG, K. C. EOM, S. H. LEE (South Korea) & A. SMITH (UK)
- 1291 Chloroform in the environment: occurrence, sources, sinks and effects  
A. MCCULLOCH (UK)
- 1309 Comparisons of coarse and fine versions of two carbons for reducing the bioavailabilities of sediment-bound hydrophobic organic contaminants  
J. A. LEBO, J. N. HUCKINS, J. D. PETTY, W. L. CRANOR & K. T. HO (USA)
- 1319 Pharmaceuticals in STP effluents and their solar photodegradation in aquatic environment  
R. ANDREOZZI, M. RAFFAELE (Italy) & P. NICKLAS (Sweden)
- 1331 Characterisation of the abiotic degradation pathways of oxytetracyclines in soil interstitial water using LC-MS-MS  
B. HALLING-SØRENSEN, A. LYKKEBERG, F. INGERSLEV (Denmark), P. BLACKWELL (UK) & J. TJØRNELUND (Denmark)
- 1343 Exposure to benzene, toluene, xylenes and total hydrocarbons among snowmobile drivers in Sweden  
K. ERIKSSON, D. TJÄRNER, I. MARQVARDSEN & B. JÄRVHOLM (Sweden)
- 1349 Kinetics and mechanism of nitrite oxidation by hypochlorous acid in the aqueous phase  
N. LAHOUTIFARD, P. LAGRANGE & J. LAGRANGE (France)
- 1359 Characteristics of MnO<sub>2</sub> catalytic ozonation of sulfosalicylic acid and propionic acid in water  
S.-P. TONG, W.-P. LIU, W.-H. LENG & Q.-Q. ZHANG (China)
- 1365 Sorption and desorption hysteresis of organic contaminants by kerogen in a sandy aquifer material  
Y. RAN (People's Republic of China), B. XIAO (USA), J. FU & G. SHENG (People's Republic of China)
- 1377 Development and evaluation of an environmental multimedia fate model CHEMGL for the Great Lakes region  
Q. ZHANG, J. C. CRITTENDEN, D. SHONNARD & J. R. MIHELIC (USA)